CLAIMS

What is claimed is:

1. A method of converting the shape of polarized eukaryotic cells, comprising the steps of:

determining a frequency of internal NAD(P)H oscillation within the polarized eukaryotic cells, and

applying an electric field of sinusoidal frequency to the cells.

2. The method of claim 1, wherein the electric field has a frequency within about ten per cent of the frequency of internal NAD(P)H oscillation within the cells.

3. The method of claim 1, wherein the field strength of the electric field is at least 10^{-2} volts/meter.

4. The method of claim 1, wherein the frequency of the electric field is substantially phase-matched to the frequency of internal NAD(P)H oscillation within the cells.

5. The method of claim 1, wherein the electric field is applied to the cells for a time period equal to at least three periods of the internal NAD(P)H oscillation.

6. The method of claim 1, wherein the electric field is applied by means of magnetic induction.

7. A method of converting the shape of polarized eukaryotic cells, comprising the steps of:

determining a frequency of internal NAD(P)H oscillation within the polarized eukaryotic cells, and

applying an electric field of sinusoidal frequency to the cells, wherein:

the electric field has a frequency within ten per cent of the frequency of internal NAD(P)H oscillation within the cells;

the frequency of the electric field is substantially phase-matched to the frequency of internal NAD(P)H oscillation within the cells; and
the field strength of the electric field is at least 10^{-2} volts/meter.

8. The method of claim 7, where the electric field is applied to the cells for a time period equal to at least three periods of the internal NAD(P)H oscillation of the cells.

9. The method of claim 7, wherein the polarized eukaryotic cells are selected from the group consisting of neutrophils, macrophages, lymphocytes, platelets, tumor cells, and retinal cells.

10. A method for converting the shape of polarized eukaryotic cells, comprising the steps of:

determining a frequency of internal NAD(P)H oscillation within the polarized eukaryotic cells, and
applying a pulsed electric field to the cells.

11. The method of claim 10, wherein the electric field has a frequency within ten per cent of the frequency of the internal NAD(P)H oscillation frequency within the cells.

12. The method of claim 10, wherein the field strength of the electric field is at least 10^{-5} volts/meter.

13. The method of claim 10, wherein the field strength of the electric field is at least 10^{-4} volts/meter.

14. The method of claim 10, wherein the electric field is applied at other than the minima of the NAD(P)H oscillation frequency.

15. The method of claim 10, wherein the electric field is applied by means of magnetic induction.

16. A method for converting the shape of polarized eukaryotic cells, comprising the steps of:

determining a frequency of internal NAD(P)H oscillation with the polarized eukaryotic cells, and

applying a pulsed electric field to the cells, where:

the electric field has a frequency within ten per cent of the frequency of the internal NAD(P)H oscillation within the cells, and

the field strength of the electric field is at least 10^{-5} volts/meter.

17. The method of claim 16, where the field is applied at other than the minima of the internal NAD(P)H oscillation.

18. The method of claim 16, where the field is applied at other than about $\pm \pi/10$ radians of the internal NAD(P)H oscillation.

19. The method of claim 16, wherein the electric field is applied by means of magnetic induction.

20. The method of claim 16, wherein the polarized eukaryotic cells are selected from the group consisting of neutrophils, macrophages, lymphocytes, platelets, tumor cells, and retinal cells.

21. A method of mitigating an inflammatory condition in a mammal, comprising the step of:

applying an electric field of sinusoidal frequency to a tissue comprising an inflammatory condition of the mammal, wherein the field strength of the electric field within tissue comprises at least 10^{-2} volts/meter.

22. The method of claim 21, wherein the electric field is applied by means of magnetic induction.

23. The method of claim 22, wherein the means of magnetic induction comprises a coil applicator.

24. The method of claim 21, wherein the mammal is a human.

25. A method of mitigating an inflammatory condition in a mammal, comprising the step of:

applying a pulsed electric field to a tissue comprising an inflammatory condition of the mammal, wherein the field strength of the electric field within tissue comprises at least 10^{-5} volts/meter.

26. The method of claim 25, wherein the electric field is applied by means of magnetic induction.

27. The method of claim 26, wherein the means of magnetic induction comprises a coil applicator.

28. The method of claim 26, wherein the magnetic induction comprises a time-varying magnetic field.

29. The method of claim 28, wherein the magnetic field comprise a square wave form.

30. The method of claim 28, where the magnetic field comprises a sawtooth wave form.

31. The method of claim 25, wherein the mammal is a human.

32. A method of mitigating an inflammatory condition in a mammal, comprising the steps of:

applying a pulsed electric field to a tissue comprising an inflammatory condition of the mammal, wherein:
the field strength of the electric field within tissue comprises at least 10^{-5} volts/meter,
the electric field is applied by means of magnetic induction, and

the magnetic induction comprises a time-varying magnetic field.

33. The method of claim 32, wherein the means of magnetic induction comprises a coil applicator that is transiently energized by activation and deactivation of the coil applicator with electric current in a linear manner.

34. The method claim 32, wherein the pulsed electric field is comprised of at least one pulse train of at least two pulses.

35. The method of claim 32, wherein the mammal is a human.

36. A method of treating a pathological condition in a mammal, comprising the step of:
applying a pulsed electric field to a region of the mammal's body comprising the pathological condition of the mammal, wherein:
the field strength of the electric field within tissue comprises at least 10^{-5} volts/meter,
the electric field is applied by means of magnetic induction, and
the magnetic induction comprises a time-varying magnetic field.

37. The method of claim 36, wherein the mammal is a human.

38. A method of converting the shape of polarized eukaryotic cells, comprising the steps of:

applying an electric field to the polarized eukaryotic cells by means of magnetic induction, wherein the magnetic induction is comprised of at least two pulse trains each comprised of at least two magnetic pulses.

39. The method of claim 38, wherein at least one pulse train is delayed in phase from at least one previous pulse train.

40. The method of claim 39, wherein at least one pulse train is gated for a period of between 9 and 11 seconds.

41. The method of claim 38, wherein a first pulse train is comprised of at least six pulses gated for a period of between 9 and 11 seconds, and a second pulse train of at least six pulses is delayed in phase from a previous pulse train.

42. A method of treating a pathological condition in a mammal, comprising the step of:
applying an electric field to the polarized eukaryotic cells by means of magnetic induction, wherein the magnetic induction is comprised of at least two pulse trains each comprised of at least two magnetic pulses.

43. The method of claim 42, wherein a first pulse train is comprised of at least six pulses gated for a period of between 9 and 11 seconds, and a second pulse train of at least six pulses is delayed in phase from a previous pulse train.